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REVISION OF THE GENERA *ALLAGA* KARSCH AND *SAURACRIS* BURR (ORTHOPTERA : ACRIDIDAE)

By G. B. Popov, M.B.E.

(*Desert Locust Survey, Nairobi*)[1]

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With 2 Plates and 19 Text-figures

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I. History of the Genera *Allaga* Karsch and *Sauracris* Burr

Karsch (1896) described the genus *Allaga* with a single species, *A. ambigua*, from " Zanzibar and East Africa ". When Burr (1900) described a new genus *Sauracris* with the type-species *S. lacerta* from Somaliland, he did not mention *Allaga* in his discussion on its systematic position. Carl (1916) erected the genus *Parallaga* to accommodate his new species, *P. pigra*, alleged to have come from Madagascar, and he considered it as closely allied to, but distinct from *Allaga*, while making no mention of *Sauracris*.

Ramme (1929) reviewed the three genera and reduced both *Sauracris* and *Parallaga* to synonyms of *Allaga*, regarding the small differences, mainly in the shape of the hind margin of the pronotum, the lower lobe of the hind femur and the degree of reduction of the elytra, as insufficient for generic distinction. The three species, *A. ambigua* Karsch, *A. lacerta* (Burr) and *A. pigra* (Carl) remained valid, and he described two more, *A. striolata* from northern Kenya and *A. parvula* from Somaliland.

The present study of extensive material of members of this group has shown that *A. ambigua* posseses a number of important characters, not considered by Ramme, which distinguish it from all the other species (p. 8). These differences can only be regarded as generic and the present revision, therefore, establishes *Allaga* as a monotypic genus, with *A. ambigua* Karsch as its type-species, while *Sauracris*, with the type-species *S. lacerta* Burr, is reinstated to include all the other species already described, as well as three new ones,

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S. ornata, *S. crypta* and *S. zinae*, from Somaliland and Somalia and a new subspecies, *S. parvula arabica*, from south-western Arabia. Yet another distinct species of *Sauracris* from Somalia cannot be described at present, being known only from a nymph.

II. Material Examined

Owing to their peculiar behaviour and habitat, these insects have largely escaped the attention of general collectors and for a long time only a few isolated specimens were known. During the last fifteen years, however, series of specimens have accumulated in the British Museum, chiefly as a result of contributions by members of the Desert Locust Survey and Control Organisation. The individual collectors are mentioned under each species, but I should like to thank particularly Messrs. D. J. Greathead, R. A. Hall, J. Roffey and Meyad Hussein for their help in collecting specimens. My thanks are also due to the Berlin Museum for the loan of the types of *A. ambigua*, the Geneva Museum for the type of *Parallaga pigra*, and to the Hope Museum of Oxford for that of *Sauracris*. I am also grateful to Dr. B. P. Uvarov and Dr. V. M. Dirsh for their assistance and advice in the course of this work.

The genitalia of the following specimens were extracted and examined, the method described by Dirsh (1956) being used: *A. ambigua; S. lacerta* (6, 8, 17); *S. pigra* (4); *S. striolata* (16); *S. parvula parvula* (5); *S. p. arabica* (11); *S. ornata* (7); *S. crypta* (1–3, 9, 10, 12–15). The specimens and the spirit preparations of the genitalia bear labels with their numbers (as indicated in brackets) and are deposited in the British Museum, except those of *A. ambigua*, which are in the Berlin Museum.

Unless otherwise specified, all the material is in the British Museum (Natural History).

III. Systematic Position of the Genera and their Geographical Distribution

The two genera have no near relatives but resemble in appearance certain members of the tribe Catantopini, e.g. *Physocrobylus* Dirsh, but particularly the aberrant Socotran genus *Dioscoridus* Popov, although, owing to the presence of an outer apical spine in the latter genus, the similarity may be purely superficial.

On the assumption that *S. pigra* (Carl) is of Arabian origin and not from Madagascar (*see* p. 16), the present known distribution of the species of *Allaga* and *Sauracris* is as follows:

	Zanzibar, E. Africa	Kenya	Somalia	Somaliland	Dankalia (French Somaliland)	S.W. Arabia
A. ambigua	+	–	–	–	–	–
S. striolata	–	+	–	–	–	–
S. zinae	–	–	+	–	–	–
S. sp. nov.	–	–	+	–	–	–
S. parvula parvula	–	–	+	+	–	–
S. lacerta	–	–	+	+	–	–
S. ornata	–	–	–	+	–	–
S. crypta	–	–	–	+	+	–
S. parvula arabica	–	–	–	–	–	+
S. pigra	–	–	–	–	–	+

Allaga ambigua is still known only from the original specimens bearing the label " Hildebrandt, Zanzibar, E. Africa ". This may in fact mean that the specimens were taken on Zanzibar island, or they could actually have been

FIG. 1.—Geographical distribution of *Allaga* and *Sauracris*. The broken line shows the limits of the Somali-Arid faunal area (*after Chapin*).

taken on some part of the mainland, since Hildebrandt is known to have collected also as far inland as the Kitui district in central Kenya (about 1° 30′ N., 38° 30′ E.) at the time when the coastal areas of the mainland were administered from Zanzibar. However, in spite of the close relationship between *Allaga* and *Sauracris*, the differences are at a generic level without

any known intermediates, which suggests a fairly long isolation and favours the view that *Allaga* may be a Zanzibar endemic.

On the other hand, *Sauracris* is widespread from northern Kenya to Dankalia and south-western Arabia (fig. 1). This distribution almost exactly coincides with the Somali-Arid faunal area of Chapin (1932) and Ripley (1954). While future collecting may well extend the southern and western limits of the known distribution, the northern extension of *Sauracris* appears to lie well within the boundary of the Somali-Arid area, since it has been specifically looked for by myself and others, but not found in suitable habitats in northern Eritrea, the Sudan, and in Oman. *Sauracris* therefore appears to be one of the endemic genera found in the Horn of Africa, which spread into suitable habitats in south-western Arabia before its final separation from Africa in the late Pliocene (Ripley, 1954). The isolation has been sufficiently long for the evolution of a distinct Arabian species (*S. nigra*), while the other member of the genus found in Arabia (*S. parvula arabica*) can be distinguished from the typical African form (*S. p. parvula*) only as a subspecies.

The origin of the *Allaga-Sauracris* group is obscure in view of our lack of knowledge of any close relatives elsewhere. Its apparent absence from Socotra, where the corresponding ecological niche is at least partly filled by the less specialised *Dioscoridus* Popov (Uvarov and Popov, 1957), is puzzling. One of the likely sources of its origin could be the Karoo stock, remarkable for the abundance of primitive forms. Uvarov (1938) quotes examples of the desert-icolous elements derived from this stock extending by a chain of species, occurring in isolated arid localities in Eastern Africa, up to the Red Sea coast, with a few extending to SW. Arabia. Only future collecting may throw more light on this problem.

The number of species known at present is certainly far from complete. There is, for instance, a definitely new species of *Sauracris* represented in the collection only by a nymph (p. 23). Moreover, collecting has been very patchy. While numerous specimens are known from the Somaliland Protectorate, northern Somalia and southern Arabia, hardly any have been collected in central or southern Somalia and none in the Ogaden province of Ethiopia, where the discovery of further new species can be expected in the future, particularly in parts of southern Ogaden with suitable ecological conditions. In this respect this revision is premature, but it has been undertaken in the hope that a better knowledge of this interesting group, however incomplete, may arouse greater interest and encourage future collecting and observation.

IV. Ecology and Biology

Nothing is known of the habits or the habitat of *Allaga* and the following description is therefore confined to *Sauracris*. The latter has been found in a variety of ecological zones from the arid plant communities of south-western Arabia, the Guban of Somaliland and the Mijertein province of Somalia (Pl. I, fig. 2) typical for *S. parvula* ssp., to the xerophilous open woodlands of southern and eastern Somaliland (Pl. II, fig. 1), forming the typical habitat of *S. lacerta*, and the semi-arid evergreen woodlands of the Erigavo escarpment (Pl. II, fig. 2), the only locality where *S. ornata* has been found. Specific differences in ecology will be discussed in greater detail under individual species, and here

only broader considerations, believed to be typical for the genus as a whole, are offered. These are based on personal observations on *S. pigra*, *S. parvula*, *S. lacerta*, *S. ornata* and, particularly, *S. crypta*.

The most striking feature of *Sauracris* is its habit of hiding under bark of trees, at least in the daytime, where its flattened, yet powerful build allows it to penetrate even into the narrowest crevices. This behaviour is most unusual for Acrididae and even more characteristic of this insect than its appearance. Marked preference is shown for trees which have died recently, or only partly, and in which the bark has just begun to peel off. Older trees infested with termites and other insects and the spaces under the bark fouled with dust and debris, are apparently avoided. Furthermore, spaces under fairly large clean strips of bark are preferred to those under smaller flakes and chips. The choice of a tree is apparently governed more by these factors than by the particular species of plant. Although *Sauracris* has usually been found under the bark of *Acacia* spp., chiefly *A. tortilis*, which is common in its area of distribution, the same, or other species, have also been recorded from *Balanites* spp., *Dobera glabra*, *Buxus hildebrandtii*, *Anisotes* sp., and other plants as well as from logs of undetermined species, but always in similar situations (Pl. I, fig. 1).

Although some specimens have been found singly, there is a tendency for up to a dozen or so individuals to form small colonies in the same branch of a tree and, to judge by the accumulation of faecal pellets under the bark and on the ground under such branches, these sites are sometimes used by large numbers for a considerable time.

These sites probably serve merely as refuges in the daytime in much the same way as similar situations would be used by geckos, small bats and some nocturnal insects. This conclusion was reached from cage observations on *S. crypta*, which appeared to be entirely nocturnal. The insects hid during the day under bark, fallen leaves and in the dark corners of the cage, where they remained motionless for long periods. They emerged and became fairly active at dusk, crawling about along branches and sides of the cage. Jumping was only seen on disturbance. *Sauracris* is a powerful jumper, covering distances of over three yards in a single leap and remaining quite still or hiding immediately on landing, becoming most difficult to spot a second time. The caged specimens fed readily at night on leaves of *Balanites orbicularis*, the tree on which they were originally found, but also on grasses and other annual herbs which were offered, being evidently fairly catholic in their choice of food, though never seen to feed on the dead wood or bark.

In spite of its nocturnal habits, *Sauracris* does not appear to be attracted to light and such records as exist (*S. lacerta* and *S. parvula*) (collected by C. L. Collenette) probably refer to cases where the insects were in firewood, which they later abandoned, particularly when the logs were put on the fire. A series of ten *S. parvula* were once collected by me in this manner.

The caged insects oviposited readily into the dry sand on the bottom of the cage. Old egg-pods, indistinguishable from these, were also found in the sandy soil at the base of trees supporting populations of *S. crypta*. This would seem to be a normal oviposition site.

The freshly laid egg-pod of *S. crypta* (fig. 2) is 5·5 mm. in diameter and 36 mm. long, of which the egg mass comprises 20 mm. and the froth the remaining 16 mm. The froth is friable and light brownish-buff; the froth-plug terminates

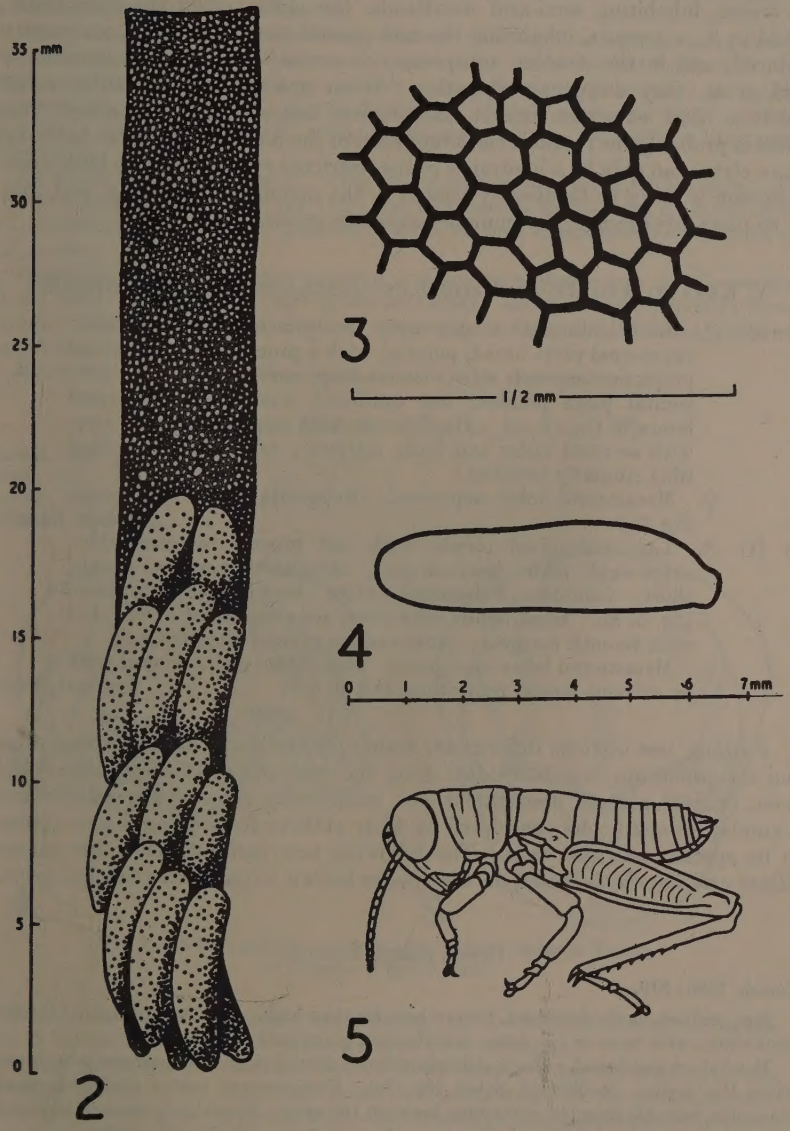
about 1 cm. or slightly less below the surface and has no lid. The egg-pod has no earth walls, nor envelope of froth ; there is also very little froth between the eggs, which separate readily. The eggs lie more or less vertically in an arrangement nearest to the " radially symmetrical " of Chapman and Robertson (1958). There are on average about 20 eggs in each egg-pod. The egg is 6 mm. long and the largest diameter 1·5 mm. (fig. 4). The eggs are very characteristic, being a deep chocolate brown, the chorion tough and heavily sculptured with more or less regular hexagonal cells with well raised margins (fig. 3), giving the surface a shagreened appearance. The egg is constricted at the micropyle, where the sculpturing is somewhat fainter, while on the cap it is heavier and less regular than elsewhere.

Although the egg-pod is unprotected, the tough structure of the chorion evidently affords sufficient protection against desiccation. Eggs laid in cages in Berbera in January, 1957, were kept air-dry until the following December, when they were placed in moist sand in the constant temperature room in the laboratory of the Anti-Locust Research Centre in London. The majority hatched 3–4 weeks later.

S. crypta thus shows a fairly efficient adaptation to the arid climate of its habitat, characterised by the irregular nature and the paucity of rainfall, with prolonged periods of drought, which it is evidently able to survive in the egg stage. Eggs laid in the soil remain dormant until a fall of rain, when incubation takes place. Apart from this delayed embryonic development in the absence of adequate moisture in the soil, there appears to be no fixed diapause at any stage in the life cycle, for nymphs and adults of this and other species in all stages of maturation were taken at practically any time of the year. This feature, together with the nocturnal habits and concealment in the daytime permitting *Sauracris* to avoid extremes of weather conditions, must contribute to its survival during the dry season. A notable example of this was provided in the spring 1957, by the abundance of *S. parvula* after a prolonged drought on the Makir coast of Somaliland Protectorate east of Mait, while *S. crypta* was sufficiently numerous to cause visible damage to parts of *Balanites* woodland, near Bulhar.

Natural enemies are amongst factors controlling the populations of *Sauracris*. Remains of these insects were often found trapped in cobwebs under the bark, while numbers probably fall prey to scorpions, solifuges, geckos and other nocturnal animals. Samples of *S. crypta* taken near Bulhar in the spring of 1957 showed a very high percentage of parasitisation by the endo-parasitic Nemestrinid, *Symmictus flavopilosus* Bigot (Greathead, 1958).

The flattening of the body is less pronounced in the nymphs, which are much more like normal Acridid nymphs, particularly in the younger stages. In the newly hatched nymph (fig. 5), the pronotum is somewhat roof-shaped, with a well-defined median carina, which continues along the abdomen ; the lateral lobes of the pronotum are as high as long. The hind femur has well-defined upper and lower keels. The nymphs become progressively flatter in the later stages ; the dorsal carina gradually disappears, but the keels of the hind femur persist until the final moult. This suggests that *Sauracris* has apparently evolved from an Acridid of a more normal, less flattened, shape. The evolution may have been to some extent influenced by climatic changes, as suggested by the apparent connection between the degree of brachypterism



FIGS. 2–5.—*Sauracris crypta* sp. n. (2) Egg-pod ; (3) sculpture of egg chorion ; (4) egg ; (5) newly-hatched nymph.

and the aridity of the habitat. Thus, in the more mesophilous species such as *S. ornata*, inhabiting semi-arid woodlands, the elytra cover the tympanum, while in *S. p. parvula*, inhabiting the arid coastal zones, the elytra are greatly reduced, and in the Arabian subspecies, *S. parvula arabica*, from even more arid areas, they disappear altogether. Other species from transition areas between these extremes exhibit intermediate stages of brachypterism. This effect is probably the result of the adaptation of the insect to its shelter-habitats. Since elytra can only be a hindrance in the restricted space under the bark, their reduction is likely to be directly related to the amount of sheltering, and thus to be more advanced in the more deserticolous species.

V. Keys to, and Redescriptions of, Genera and Included Species

1 (2) ♂. Last abdominal tergite with two processes on each side; supra-anal plate broad, pointed, with a prominent sharp lateral projection on each side; cercus long, curved, pointed. Subgenital plate pointed, not upturned, somewhat compressed laterally (fig. 6, A). Hind femur with expanded lower area, with serrated outer and inner margins; inner surface of hind tibia similarly serrated.

♀. Metasternal lobes separated. Subgenital plate emarginate (fig. 9*a*) . . . . . **Allaga** Karsch

2 (1) ♂. Last abdominal tergite with one process on each side; supra-anal plate heart-shaped, attenuate; cercus simple, short, pointed. Subgenital plate boat-shaped, upturned (fig. 6, S). Hind femur with lower area expanded or not, but with smooth margins; inner surface of hind tibia normal.

♀. Metasternal lobes contiguous. Subgenital plate pointed, with or without lateral projections (fig. 9, *b–h*) . . . **Sauracris** Burr

Further, less obvious differences, mainly in the shape of the frontal ridge and the pronotum, will be evident from the descriptions of the genera. The three original generic descriptions not unnaturally show disagreements and a number of characters considered by their authors to be generic now appear to be specific and *vice versa*. The following new descriptions of the genera *Allaga* and *Sauracris*, based on the species known to date, are therefore given.

Genus *Allaga* Karsch

Karsch, 1896 : 319.

Size medium, body depressed, thorax broader than high. Coloration bright. Integument shiny, with more or less dense, but shallow, puncturation.

Head short and broad. Frons strongly oblique, frontal ridge with margins pronounced above the ocellus, obsolescent below (fig. 7*a*). Fastigium of vertex sloping forward, triangular, margins strongly converging between the eyes. Eyes closely spaced, large and prominent, somewhat less than half again as long as deep. Ocelli well developed.

Pronotum depressed dorsally, without median or lateral carinae. Anterior margin slightly projecting forward, hind margin emarginate, not quite covering the mesonotum; intersected by 3 broad but shallow sulci, the anterior one short; metazona somewhat less than one-third the length of prozona. Lateral lobes about twice as long as high, with rounded but distinct lower angles and a sinuate lower margin. Prosternal tubercle short,

rounded. Mesosternal lobes quadrate with rounded angles ; metasternal lobes contiguous in males, narrowly separated in females.

Tympanum developed. Elytra strongly reduced. Male supra-anal plate broad, pointed, with a prominent sharp lateral projection on each side ; last abdominal tergite with two small sclerotised lateral processes on each side ; cercus long, curved, pointed ; subgenital plate pointed, not upturned, compressed laterally. Female supra-anal plate obtusely triangular ; cercus short, pointed ; subgenital plate emarginate. Ovipositor with exposed stout valves.

All femora more or less inflated ; lower area of hind femur expanded in the male, with serrated inner and outer margin (fig. 11A) ; the upper surface rounded with the carina more or less obliterate. Hind tibia without apical spine, its inner surface serrated. Arolium as long as claw.

Epiphallus (fig. 10*a*) of a type occurring in many unclassified genera of Catantopinae (Dirsh, 1956) ; bridge-shaped, more or less sclerotised ; anchorae large, incurved ; lophi lobiform, large ; lateral plates distinct ; anterior projections well developed, posterior ones absent.

A monotypic genus with *Allaga ambigua* Karsch as its type species.

Allaga ambigua Karsch. (Figs. 6A, 7*a*, 11A, 12A)

Karsch, 1896 : 320, figs. 36 *a–c*.
Kirby, 1910 : 485.
Ramme, 1929 : 459, Pl. 14, fig. 11.
Johnston, 1956 : 298.

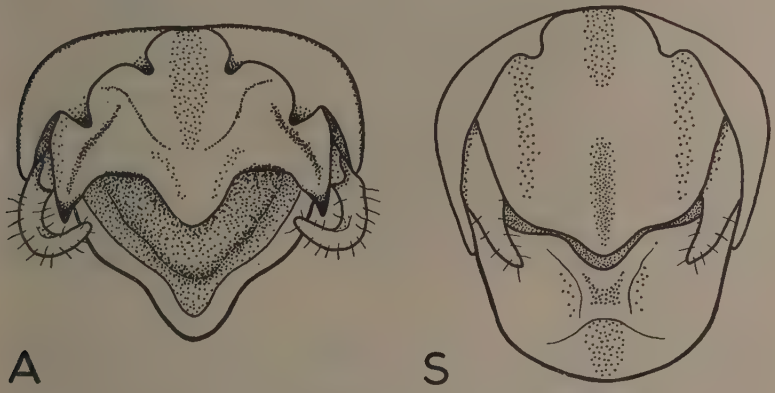


FIG. 6.—External male genitalia of (A) *Allaga ambigua* Karsch ; (S) *Sauracris lacerta* Burr.

This species is distinct not only in its morphological characters, which have now necessitated its recognition as a separate genus, but also in its coloration.

Ground colour stramineous-yellow with the darker areas of a deep black-green, forming a triangular patch on the occiput and dorsal and lateral stripes on the pronotum, these patches also occurring on dorsal side of metanotum and first abdominal tergite, but not on mesonotum, while on the remaining abdominal tergites they appear as faint dark spots. Sides of thorax purplish. Upper surface of hind femur with irregular dark-green patches ; upper side of hind knee black with small white spots, while inner and outer lobe of hind knee, lower and inner side of hind femur, apical two-thirds of hind tibia and base of hind tarsus are a bright cherry-red. Anterior and middle tibia bear dark bands. Coloration of female similar to male, but the dark areas of a lighter shade.

Allaga ambigua is possibly nearest to *Sauracris striolata*, which shows a similar expansion of the lower external area of the hind femur (p. 17), but without the serrated margins. It differs from it, as indeed from all the other species of *Sauracris*, which show a remarkable constancy in this character, in the structure of the external male genitalia.

The species continues to be known only from the original specimens alleged to have been collected by Hildebrandt on Zanzibar. Nothing is known of its habitat or habits, although its appearance would seem to suggest a mesophilous habitat and arboreal existence.

Material examined :

" E. Africa and Zanzibar " : 1 ♂, 1 ♀ (types) (*Hildebrandt*, Berlin Museum), 1 ♀ (*ditto*, British Museum).

Genus *Sauracris* Burr

Sauracris Burr, 1900 : 40.
Parallaga Carl, 1916 : 490.

Size medium to small, body depressed, thorax usually distinctly broader than high, or at the most as high as broad. Of varying, sometimes bright coloration. Integument shiny with more or less dense, but shallow, puncturation.

Head short and broad. Antenna filiform, in males usually as long as head and pronotum together, but sometimes somewhat shorter. Frons strongly oblique ; frontal ridge with more or less pronounced margins continuing below the ocellus and sometimes reaching the clypeus (fig. 7, *b–h*). Fastigium of vertex sloping forward, shallow, subtriangular or trapezoidal. the margins strongly convergent between the eyes. Eyes closely spaced, large and prominent, less than half again as long as deep. Ocelli well developed.

Pronotum rounded, more or less depressed dorsally, without median and lateral carinae. Anterior margin slightly projecting forward, hind margin more or less emarginate (fig. 8), not quite covering the mesonotum ; intersected by 3 transverse sulci, the anterior one short ; metazona about one-third length of prozona, sometimes less. Lateral lobes longer than high, with broadly rounded angles and a wavy lower margin. Prosternal tubercle short, subconical. Mesosternal lobes quadrate, with rounded angles. Metasternal lobes contiguous in both sexes.

Tympanum developed or vestigial. Elytra strongly reduced or absent. Male supra-anal plate heart-shaped, attenuate ; last abdominal tergite with a small lateral process on each side ; cercus small, simple, pointed ; subgenital plate boat-shaped, somewhat truncate, upturned. Female supra-anal plate obtusely triangular ; cercus short, pointed ; subgenital plate more or less pointed, with or without lateral projections (fig. 9, *b–h*) ; ovipositor with exposed stout valves, the upper sometimes somewhat toothed.

All femora more or less inflated ; lower area of hind femur sometimes expanded, particularly in the male, with smooth margins ; the upper surface usually rounded with carina more or less obliterate. Hind tibia without an apical spine, its inner surface smooth. Arolium as long as, or shorter than, the claw.

Epiphallus (fig. 10, *b–g*) of a type occurring in many unclassified genera of Catantopinae (Dirsh, 1956) ; bridge-shaped, more or less sclerotised ; anchorae moderately large, incurved ; lophi lobiform, large ; lateral plates distinct ; anterior projections more or less well developed, posterior ones absent.

Type-species : *Sauracris lacerta* Burr, 1900.

The known species of *Sauracris* are superficially rather similar, presenting few obvious morphological characters for their differentiation. The following

were found to be the most useful: In habitus, most species have a depressed body with the width/height ratio at the metathorax (*vide* Uvarov, 1938) about 1·5. The exception is the uniformly expanded *S. zinae* with a ratio of 1 and the fusiform *S.* sp. n., with a distinctly inflated metathorax. The antenna is as long or longer than the head and pronotum in most species, except in *S. parvula* (and possibly some others). However, since antennae are often lost in dry specimens, this is a character of doubtful value. The frontal ridge is subject to variation, providing one of the best specific characters (fig. 7, *b–h*).

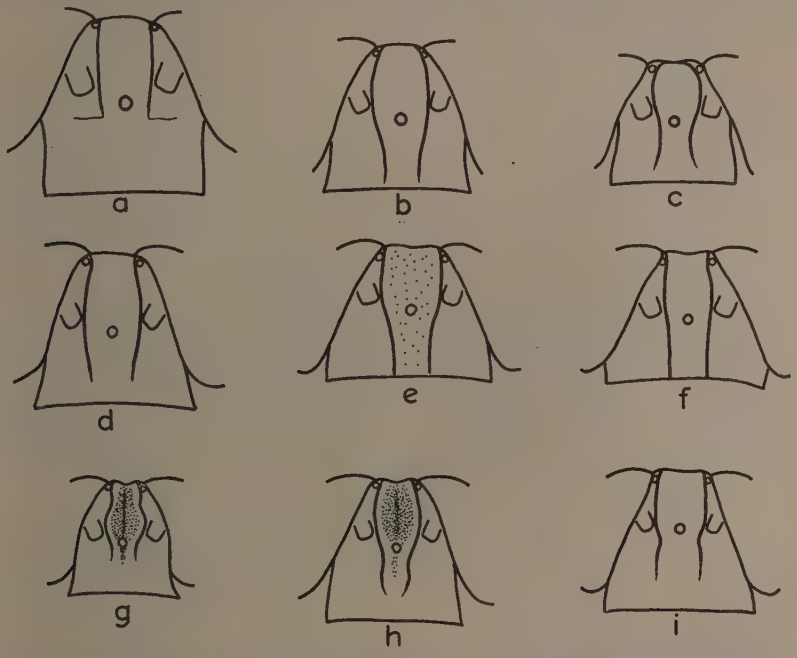


Fig. 7.—Frontal view of face: (*a*) *Allaga ambigua*; (*b*) *Sauracris lacerta*; (*c*) *S. pigra*; (*d*) *S. striolata*; (*e*) *S. ornata*; (*f*) *S. crypta*; (*g*) *S. parvula*; (*h*) *S. zinae*; (*i*) *S.* sp. n.

The emargination of the hind pronotal margin varies as in figure 8 (this character is most useful for the identification of *S. zinae*); its lateral lobes are higher in less depressed species. The elytron and tympanum are reduced progressively as follows: *S. ornata*, *S. crypta*, *S. striolata*, *S. lacerta*, *S. pigra*, *S. p. parvula*, *S. zinae*, *S. parvula arabica*. The external lower area of the hind femur is expanded in *S. striolata*, but not in the other species. The arolium is as long as the claw in *S. ornata* and only half as long in *S. parvula* and *S. zinae*, being intermediate in the others. The female subgenital plate varies as in figure 9, providing another good specific character. The epiphallus is shown in figure 10. Coloration is on the whole more reliable than in most Acrididae and is a useful character, particularly for distinguishing *S. lacerta* from *S. pigra*.

Key to Species

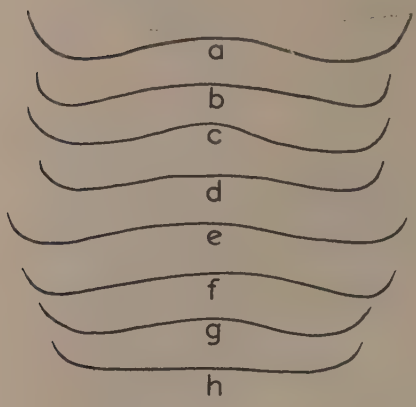
1 (2) Elytra extending beyond hind margin of metanotum and partly or wholly covering the tympanum, which is well developed **S. ornata** sp. n. (fig. 16)

2 (1) Elytra vestigial, not reaching hind margin of metanotum, or absent.

3 (4) Lower external area of hind femur expanded, at least in the male **S. striolata** (Ramme) (fig. 14)

4 (3) Lower external area of hind femur not expanded.

5 (10) Tympanum small but well developed. Elytra small (1–3 mm.), but clearly visible. Hind tibia not red. Size medium (♂ over 20 mm. ; ♀ over 30 mm.).



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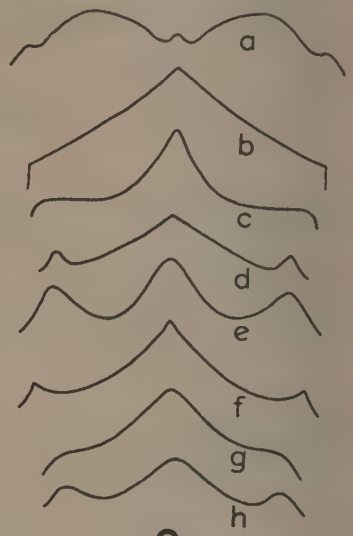

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FIGS. 8–9.—(8) Hind margin of pronotum: (*a*) *Allaga ambigua* ; (*b*) *Sauracris lacerta* ; (*c*) *S. pigra* ; (*d*) *S. striolata* ; (*e*) *S. ornata* ; (*f*) *S. crypta* ; (*g*) *S. parvula* ; (*h*) *S. zinae*. (9) Female subgenital plate : (*a*) *Allaga ambigua* ; (*b*) *Sauracris lacerta* ; (*c*) *S. pigra* ; (*d*) *S. striolata* ; (*e*) *S. ornata* ; (*f*) *S. crypta* ; (*g*) *S. parvula* ; (*h*) *S. zinae*.

6 (7) Outer face of hind femur with one or two black longitudinal stripes. Subgenital plate of female simple, pointed (fig. 9*b*) **S. lacerta** Burr (figs. 11, 12)

7 (6) Hind femur without black stripes. Subgenital plate of female with more or less pronounced lateral projections (fig. 9, *c–h*).

8 (9) Margins of frontal ridge converging below the ocellus and not reaching the clypeus (fig. 7*c*). Subgenital plate of female with rounded projections (fig. 9*c*). Hind tibia bluish **S. pigra** (Carl) (fig. 13)

9 (8) Margins of frontal ridge nearly straight and reaching the clypeus (fig. 7*f*). Subgenital plate of female with pointed projections (fig. 9*f*). Hind tibia the colour of the body **S. crypta** sp. n. (fig. 17)

10 (5) Tympanum vestigial. Elytra minute (under 1 mm.), scarcely visible, or absent. Hind tibia red. Size small (♂ under 20 mm. ; ♀ under 30 mm.).

11 (12) Pronotum distinctly convex in profile, lateral lobes nearly as high as long ; hind margin of pronotum almost straight (fig. 8*h*) **S. zinae** sp. n. (fig. 18)

12 (11) Pronotum flat, its lateral lobes considerably longer than high ; hind margin broadly emarginate (fig. 8*g*).

13 (14) Elytra present . . . . . **S. parvula parvula** (Ramme) (fig. 15)

14 (13) Elytra absent . . . . . **S. parvula arabica** subsp. n.

Note: Sauracris sp. n. (p. 23), is not included in this key, but is readily recognised by its fusiform shape.

Sauracris lacerta Burr. (Figs. 11s, 12s)

Sauracris lacerta Burr, 1900 : 41, Pl. 2, fig. 3.
Sauracris lacerta Rehn, 1901 : 376 (?).
Sauracris locusta (sic !) Kirby, 1910 : 468.
Allaga lacerta Ramme, 1929 : 459, Pl. 14, fig. 14 ; fig. 962.
Allaga lacerta Uvarov, 1930 : 183.
Allaga lacerta Johnston, 1956 : 298.

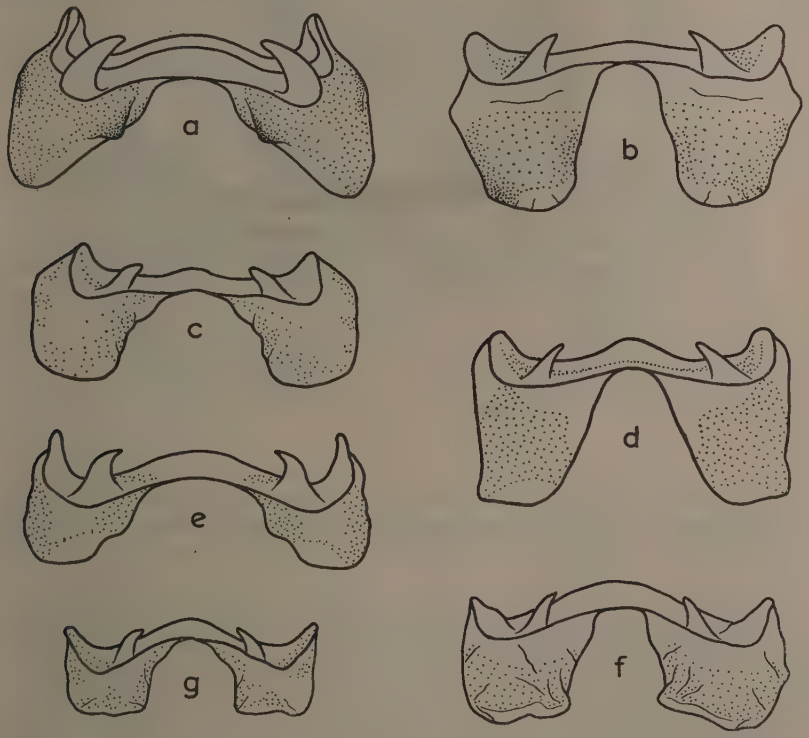

FIG. 10.—Epiphallus : (*a*) *Allaga ambigua* ; (*b*) *Sauracris lacerta* ; (*c*) *S. pigra* ; (*d*) *S. striolata* ; (*e*) *S. ornata* ; (*f*) *S. crypta* ; (*g*) *S. parvula*.

Burr (1900) based his description on a male from " Central or East Somaliland " and on a female from " North-west Somaliland ". They belong to different colour forms (see below) and the male is here designated as the type ; it is in the Hope Department, Oxford.

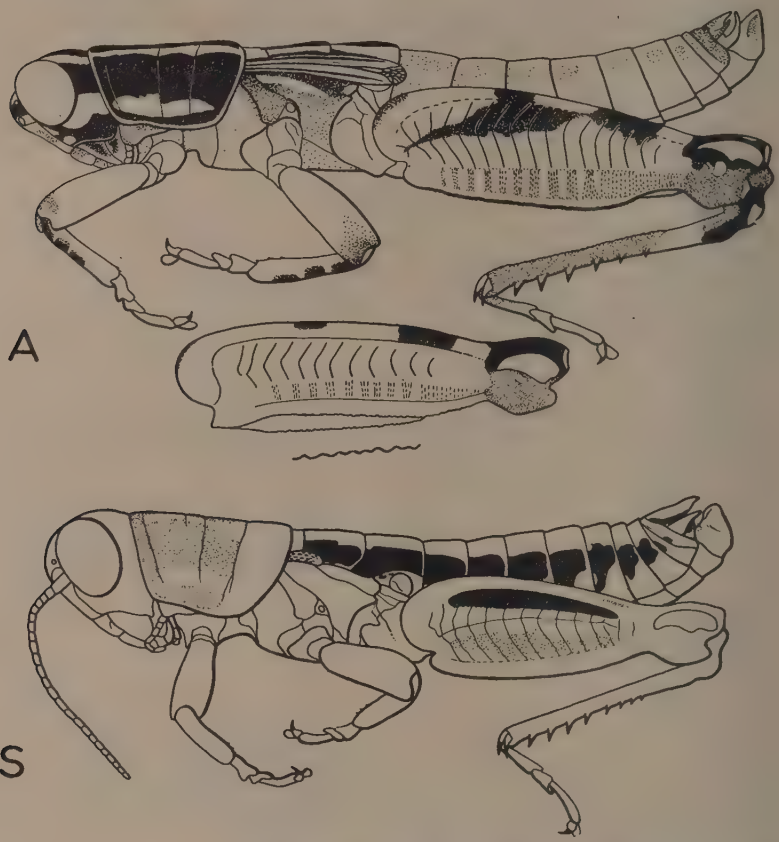

Fig. 11.—Side view of (A) *Allaga ambigua* Karsch. (Inset shows inside of hind femur and (below) the serrated lower margin under high magnification.) (S) *Sauracris lacerta* Burr.

S. lacerta may be distinguished from *S. pigra* and *S. crypta*, which it resembles in its general habitus and size, by the shape of its frontal ridge (fig. 7*b*), the subgenital plate of the female (fig. 9*b*) and the epiphallus (fig. 10*b*), but most readily by its coloration—namely the presence of black areas on the abdominal tergites and the edges of the externo-median area of the hind femur and sometimes (as pointed out by Uvarov, 1930) faint yellow stripes on the pronotum. Actually, in respect of coloration, the available material falls into two distinct forms, without any obvious intermediates. The first (figs. 11s, 12s), agreeing

with the designated type, is represented by specimens chiefly from the Haud in southern Somaliland Protectorate. In the males, the black pattern on the tergites forms an almost continuous subdorsal stripe extending from the metanotum nearly to the tip of the abdomen. The hind femur has only one distinct black longitudinal stripe along the upper margin of the externo-median area.

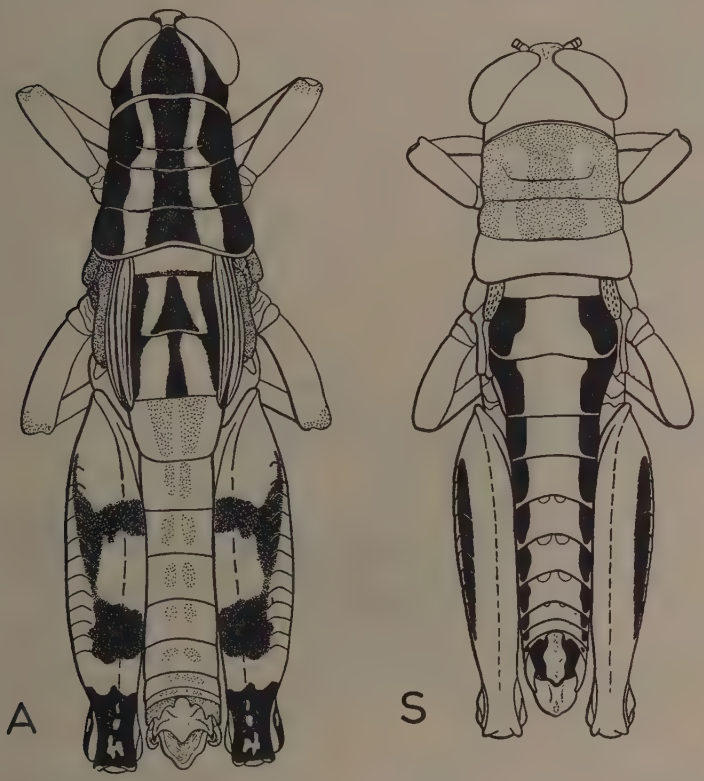

FIG. 12.—View from above of (A) *Allaga ambigua* Karsch ; (S) *Sauracris lacerta* Burr.

In females there is no subdorsal band, only two small black spots, one on each side near the base of the elytron, which sometimes disappear altogether, and two or three indistinct stripes on the sclerites.

The second population, to which Burr's female belongs, is represented by specimens principally from eastern Somaliland and northern Somalia. In the males the black pattern is represented by distinct black vertical stripes on the tergites, while the externo-median area of the hind femur bears two longitudinal black stripes. In the females the black pattern is similar, but somewhat fainter.

These colour forms might be regarded as distinct subspecies or races, but I refrain from doing so because there is a possibility that intermediate forms may be found.

S. lacerta inhabits xerophilous open woodlands (Pl. II, fig. 1), which cover vast areas of southern Somaliland and northern and central Somalia, extending into the Ogaden Province of Ethiopia. The distribution of this species, therefore, is likely to be much wider than is known at present.

Specimens examined :

Somaliland : (Central or East), 5.vi–29.x.1897, 2 ♂ (including type) ; North-west, Hargeisa, 25.iv.1895, 1 ♀, 1 nymph (*C. V. A. Peel*) (Hope Department, Oxford). Bohodle, 19.ii.32, 1 ♂ ; Haud (8° 29′ N., 45° 32′ E.), 29.v.32, 1 nymph (*R. H. R. Taylor*). Bihen (80 m. E. of Las Anod), 18.ii.35, 1 ♂, 1 ♀ ; Las Anod, 21.x.35, 1 ♀ ; 8.i.36, 1 ♂ (*E. Peck*). Buran, 8.x.29, 1 ♀ ; 7.xii.29, 1 ♂, at light (*C. L. Collenette*). Herod Hills, i.47, 1 ♀ (*W. H. Wood*). Ainabo–Las Anod, 8.x.47, 1 ♀ (*Z. Waloff*). Nr. Ainabo, 26.i.57, 2 ♂, 2 ♀, 1 nymph (*G. Popov*). Ainabo, 19.xi.57, 3 ♂, 3 ♀ ; Nr. Hudin, 23.xi.57, 5 ♂, 5 ♀ (*M. Hussein*).

Somalia : Near El Gall, 12.i.57, 5 ♂, 5 ♀, 1 nymph ; Gardo, 20.i.57, 1 ♂, 2 ♀ (*G. Popov*). Galkayu, 21.x.57, 1 ♂ ; El Dere, 10.xii.57, 2 ♀ (*J. Roffey*).

Sauracris pigra (Carl) **comb. nov.** (Fig. 13)

Parallaga pigra Carl, 1916 : 492.
Allaga pigra Ramme, 1929 : 460, Pl. 14, fig. 13 ; fig. 96*b*.
Allaga pigra Johnston, 1956 : 299.

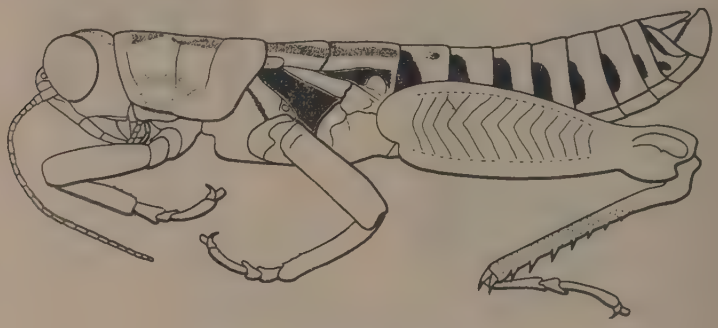

Fig. 13.—*Sauracris pigra* (Carl).

Ramme (1929) drew attention to the similarity of Carl's male type, labelled " Madagascar, Grandidier ", to the specimen of a female in the Berlin Museum bearing the label, " Arabia felix, Ehrenberg, Cat. Nr. 1876 ", expressing his doubts of such a possibility. With the material at my disposal, I have no alternative but to consider that Carl's type was almost certainly mislabelled, since, allowing for its poor condition, it is indistinguishable from the available Arabian series. The deformed, asymmetrical pronotum of the type, possibly a result of unsuccessful moulting, may well account for the rather exaggerated emargination of the hind margin (fig. 96*b*, not *a*, in Ramme, 1929 : 460). According to its author, *S. pigra* is completely apterous ; in fact, on one side

the thorax in the type is damaged, but strong magnification has revealed the remains of the rudimentary elytron on the other side, similar to that of *S. lacerta*. Finally, although the type is badly discoloured, it nevertheless shows the short, oblique carmine-red streaks on the pronotum and thorax, which are very characteristic of the Arabian specimens. How the error has arisen is a matter for conjecture ; perhaps the specimen was brought on board a ship with a cargo, such as firewood or timber, taken on at an Arabian port, *e.g.* Hodeida or Aden, and not captured until the ship docked at Madagascar. Whatever the reason, there can be little doubt that it came originally from south-western Arabia.

With the exception of the characters mentioned above, Carl's description of the male requires little further elaboration.

Epiphallus as in figure 10*c*. Female larger and heavier (total length 31–38 ; pronotum, 6–7 ; elytron, 1 ; hind femur, 12·5–15·5 mm.). Subgenital plate acutely pointed, attenuate, with small, rounded lateral projections (fig. 9*c*). Edge of upper valve of ovipositor distinctly toothed. Coloration similar to male ; ground colour fawn, with dark areas on sides of thorax and abdominal tergites. Occiput, pronotum, metanotum and first abdominal segment with distinct subdorsal and fainter lateral oblique carmine streaks. Apical half of hind tibia bluish.

S. pigra closely resembles *S. lacerta* and *S. crypta* in its general appearance and differs from them in the shape of its frontal ridge (fig. 7*c*), the subgenital plate of the female (fig. 9*c*), more slender femora, bluish tibia, as well as in the shape of the epiphallus (fig. 10*c*).

The female from Mahfad (Aden Protectorate) differs from the others in being more depressed and in having a large black spot, with orange-red windows on the lateral lobes of the pronotum ; such differences, found in a single specimen, are not sufficient for a specific, or even subspecific distinction.

S. pigra was found inhabiting open deciduous woodlands, locally known as the " Hibata ", which develop on alluvial plains in the foothills on the seaward side of the mountains of south-western Arabia, the dominant species being *Acacia* spp., *Dobera glabra*, *Commiphora simplicifolia* and *Anisotes trisulcus*. The plant most favoured by *S. pigra* was *S. tortilis*.

Specimens examined :

" MADAGASCAR " : 1 ♂ (type) (*Grandidier*) (Geneva Museum). SAUDI ARABIA : " Hibata ", Sabiya, xi.47, 8 ♂, 2 ♀, 4 nymphs ; Jaberi, xi.47, 1 ♀, 2 nymphs (*G. Popov*). YEMEN : Al Abid, 3.i.46, 1 ♂ ; Wadi Jaira, 22.ii.46, 1 ♂ (*A. R. Waterston*). ADEN PROTECTORATE : Abyan, 1 ♀ (*Collector unknown*) ; Mahfad, i.52, 1 ♀ (*G. Popov*).

Sauracris striolata (Ramme) **comb. nov.** (Fig. 14)

Allaga striolata Ramme, 1929 : 460, Pl. 14, fig. 12 ; fig. 96*c*.
Allaga striolata Johnston, 1956 : 299.

This species appears to be nearest to *S. lacerta*, particularly in the shape of its frontal ridge (fig. 7*d*) and the epiphallus (fig. 10*d*). Its most distinguishing character is the expanded lower external area of the hind femur, at least in the male, and the mottled, brown and red coloration.

The only female in the collection is very similar to the male in size, general habitus and coloration. The subgenital plate is obtusely pointed, with a small acute projection on each side (fig. 9*d*). The edge of the upper valve of the ovipositor is wavy. Unfortunately the specimen lacks both hind femora and whether the expansion of the lower area in this species is subject to sexual dimorphism, as in *A. ambigua*, or not cannot be determined at present.

The habitat of this species, as indicated by one collector (*D. K. Kevan*), is said to be " Desert grass and thornbush ".

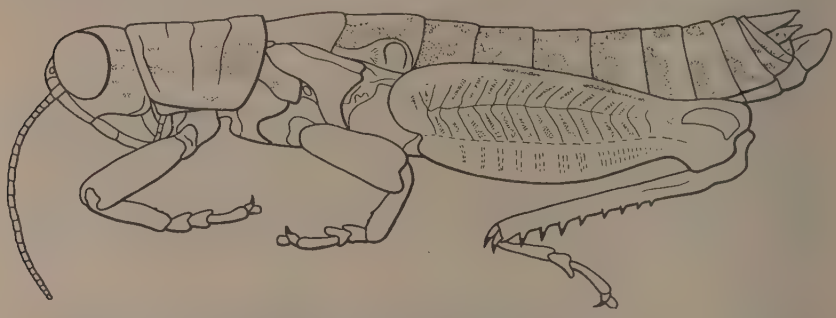

FIG. 14.—*Sauracris striolata* (Ramme).

Specimens examined :

KENYA : Turkwell River, 1913, 1 ♂ (type) (*W. P. Lowe*). El Wak, 14.xii.44, 1 ♀ ; Moyale, 15.iv.46, 1 nymph ; Mandera, 19.xii.44, 2 nymphs (*D. K. Kevan*). Wajir, N. F. D., vi.1951, 1 ♂ (*J. G. Williams*) (Coryndon Museum, Nairobi).

Sauracris parvula Ramme **comb. nov.** (Fig. 15)

Allaga parvula Ramme, 1929 : 461, Pl. 14, fig. 15.
Allaga parvula Uvarov, 1930 : 183.
Allaga parvula Kevan, 1951 : 718.
Allaga parvula Johnston, 1956 : 299.

FIG. 15.—*Sauracris parvula* (Ramme).

A species distinguished by its small size, flattened habitus, the shape of the frontal ridge (fig. 7*g*), the epiphallus (fig. 10*g*) and the red tibia.

Undescribed female somewhat larger than male (total length 20–30, pronotum 5·5–6, hind femur 12–13·5 mm.), and similar to it in shape and coloration. Subgenital plate obtusely pointed with low convex lateral projections (fig. 9*g*). Edge of upper valve of ovipositor distinctly toothed.

The typical race, *A. p. parvula*, is African and differs from the Arabian, *A. parvula arabica* by the presence of small rudimentary elytra. It inhabits the drier parts of the Makir coast of the Somaliland Protectorate and of the Mijertein province of Somalia, where it is found among the very sparse stunted *Acacia tortilis*, *A. horrida* and *A. somalensis* (Pl. I, fig. 2).

Specimens examined :

" Somali " : 1 ♂ (type).

Somaliland : Buran, 7.xii.29, 1 ♂, 1 ♀, at light (*C. L. Collenette*). Nr. Durdureh, 7.i.57, 2 ♀, 2 nymphs ; Nr. Mait, 7.i.57, 7 ♂, 3 ♀ (*G. Popov*).

Somalia : Rocca, viii.43, 1 nymph (*T. H. E. Jackson*). Nr. El Gal, 13.i.57, 4 ♂, 7 ♀, 2 nymphs ; Nr. Hordio, 15.i.57, 2 ♂, 2 ♀ (*G. Popov*).

Sauracris parvula **arabica** subsp. n.

Distinct from African race in total absence of elytra. More black pigmentation also present in Arabian than in African specimens, but, in view of the considerable variation of this aspect of coloration in both races, the difference is not sufficiently reliable.

All the specimens were collected by Mr. W. Thesiger on his expeditions in southern Arabia. The habitat is believed to be arid and the woody vegetation is sparse *Acacia tortilis*, largely confined to water-courses.

Specimens examined :

Arabia (Hadhramaut) : Shelhamit, 30.i.46, 1 ♂ ; Wadi Ramah, 3.iv.47, 3 ♂ ; w. Lubat, 5.iv.47, 4 ♀ ; w. Kidiut, 25.iii.47, 1 ♂ ; Sarif, 22.iii.47, 1 ♂ ; Buger, 23.iii.47, 1 ♀ ; w. el Alaib, 4.iv.47, 1 ♀ (*W. Thesiger*).

Sauracris ornata sp. n. (Fig. 16)

Male (type). Moderately robust. Antenna about as long as head and pronotum together. Frontal ridge broadly convex in profile ; seen from the front it is shallowly sulcate, evenly expanded between the antenna and narrowed to half its width below the ocellus, with the margins well defined to the clypeal suture (fig. 7*e*). Fastigium of vertex shallow, margins joining between the eyes, interocular space as wide as antenna.

Pronotum slightly convex in profile with all 3 transverse sulci distinct. Hind margin broadly emarginate (fig. 8*e*). Lateral lobes about 1·5 times as long as high. Elytron about as long as pronotum, extending slightly beyond first abdominal segment and covering the tympanum, which is well developed (fig. 16). Hind femur moderately heavy ; upper surface rounded, lower outer surface not expanded. Arolium as long as a claw.

Epiphallus moderately large (fig. 10*e*) ; lophi small, rounded ; anterior projections attenuate ; anchorae large, curved, pointed.

Ground coloration stramineous-yellow. Face above clypeus with purplish-black smudges. Pronotum with a purple median stripe and with two lateral stripes on each side, of a deeper bluish-black ; median stripe continues on occiput as a blue triangular patch,

while the lateral stripes break up into scattered blue spots on the cheeks. Transverse sulci touched with carmine within width of dorsal band. Posteriorly, dorsal and lateral stripes continue to metathorax and abdomen ; the dorsal forming an X-shaped pattern, which gradually breaks up and joins with the lateral to form vertical stripes of a lighter shade along anterior margin of tergites. Underside light yellow. Hind femur with two irregular oblique patches, purplish above, blue-black on outer face ; inner lower surface dull scarlet. Hind tibia purple with white knees and a white sub-basal ring.

Female. Larger and a little more robust than male. Elytron relatively smaller, not reaching hind edge of first abdominal segment, or completely covering the tympanum. Subgenital plate with large lateral projections, giving a tridentate appearance (fig. 9*e*). Outer edge of upper valve of ovipositor smooth. Coloration duller and patterns less distinct than in the male.

Total length ♂ 22·5–26, ♀ 30–35 ; pronotum ♂ 5–6, ♀ 7–7·5 ; elytron ♂ 4·5–5, ♀ 4·5–5·5 ; hind femur ♂ 11–12·5, ♀ 13·5–14·5 mm.

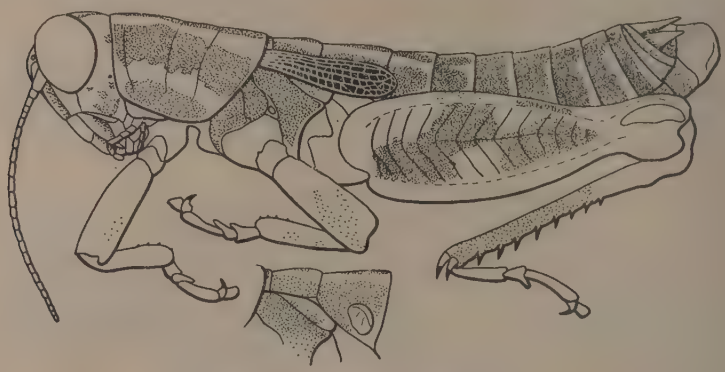

Fig. 16.—*Sauracris ornata* sp. n.

The series of specimens from the higher part of Erigavo escarpment (4000 feet) comprises smaller, but much more brightly coloured, individuals than those from the lower slopes (1000 feet). The ground colour of the body is particularly striking in the former, being a bright lemon-yellow. The coloration of the nymphs is rather different from the adults ; the ground colour is yellowish, greenish or whitish, with an intricate dark speckling.

S. ornata superficially resembles *A. ambigua* in its bright coloration and the relatively large elytra, but it is easily distinguished by the normal hind femur, the shape of the frontal ridge and the male genitalia. It is a mesophilous species, so far only found in the wooded parts of Erigavo escarpment (Pl. II, fig. 2). At lower altitudes it was taken in thickets of *Acacia tortilis* bordering larger watercourses, while on the higher slopes it was found within the *Acacia-Buxus* belt of vegetation, under the bark of trees, usually *Acacia* sp., but also *Dobera* and *Buxus*.

Specimens examined :

Somaliland : Hills N. of Erigavo, ±1000 feet, 10.i.54, 2 ♂ (including type), 4 ♀ ; Erigavo escarpment, 4500 feet, 12.i.54, 4 nymphs (*G. Popov* and *D. J. Greathead*). Erivago escarpment, 4000 feet, 4.i.57, 1 ♂, 2 ♀, 4 nymphs (*G. Popov*).

Sauracris crypta sp. n. (Fig. 17)

Male (type). Of medium size, moderately flattened. Frontal ridge straight in profile ; seen from the front it is shallowly sulcate, somewhat expanded between the antenna and slightly narrowed below the ocellus ; margins well raised above the ocellus and lowered below it, but remaining distinct to the the clypeal suture (fig. 7*f*). Fastigium of vertex shallow, margins just touching between the eyes, with the interocular space the width of antenna.

Pronotum flat in profile, slightly widened posteriorly ; all 3 transverse sulci distinct ; anterior margin broadly emarginate (fig. 8*f*). Lateral lobes about twice as long as high. Elytra scale-like, reaching to more than half-way across the metanotum. Tympanum small but distinct. Hind femur moderately heavy, upper surface rounded, lower external area not expanded. Arolium not quite as long as a claw.

Epiphallus of moderate size, lophi quadrate, with rounded angles and small transverse creases, lower margin upturned ; anterior projections small, pointed ; anchorae rather small, curved and pointed (fig. 10*f* ; epiphallus of this species has been figured by Dirsh, 1956, as that of *Allaga lacerta*).

Fig. 17.—*Sauracris crypta* sp. n.

General coloration fawn. Face and cheeks mottled with darker brown. A median stripe begins on the occiput, runs along the pronotum and continues to form the subdorsal chain of spots on the abdomen. In addition, pronotum bears 2 lateral stripes on each side ; the upper continues along sides of abdomen and gradually fades before reaching its tip. Transverse sulci of pronotum touched with carmine-red. Hind femora and tibia the colour of the body without any distinct markings.

Female. Larger, but otherwise very similar to male. Subgenital plate acutely pointed, with small pointed lateral projections (fig. 9*f*). Outer edge of upper valve of ovipositor wavy.

Total length ♂ 20–29, ♀ 30–40 ; pronotum ♂ 4·5–6·5, ♀ 6–8 ; elytron ♂ 1·2–1·5, ♀ 2 ; hind femur ♂ 9·5–12·5, ♀ 12·5–16·5 mm.

This species is nearest to *S. lacerta* and *S. pigra*, from which it differs in the shape of the frontal ridge, larger elytra and arolium but particularly in its coloration, the shape of the epiphallus and the subgenital plate of the female.

The examination of the extensive material available permits the recognition of three fairly distinct populations. The type is representative of the Somaliland plateau population, which is on the whole larger and darker, the largest and the darkest specimens being from the higher parts near Baun and Borama and the lightest and smallest from the lower parts at Burao, where the highland

population begins to resemble the lowland one. The latter, represented by specimens from Berbera and Bulhar, extending to lake Abbe in French Somaliland, is characterised by its distinctly smaller size, paler coloration with the dark pattern reduced and less distinct, and the absence of red on the transverse sulci of the pronotum. The third distinct population is from the mountainous area between Sheikh and Abdulqader. The specimens are of about the same size as those from the highlands, from which they differ by their brighter coloration : the pattern is a deep chocolate-brown, while the ground coloration of the pronotum and metanotum is light salmon-pink. Other specimens from the Danakil depression in French Somaliland and Ethiopia are nearest the highland population of Somaliland Protectorate and demonstrate the breaking down of lateral striping into a dark mottling, or transverse striping. In view of the presence of intermediates and the absence of any obvious differences except in size and coloration, I prefer to regard these populations as local variations rather than distinct geographical races.

S. crypta is now better known than any other species of the genus and the notes on ecology and biology (p. 4) are based largely on observations on this species. It inhabits the xerophilous communities of western Somaliland and Dankalia, represented on the plateau by *Acacia bussei* and *A. etbaica* and in the coastal areas and the lowlands by *A. tortilis* and *Balanites orbicularis*. It has not been found on the Makir coast, which is the habitat of *A. p. parvula*, while in the mixed xerophilous open woodlands of the Haud, eastern Somaliland and Northern Somalia, it is replaced by *A. lacerta*.

Specimens examined :

Somaliland Protectorate : Hargeisa, 28.i.57, 4 ♂ (including type), 4 ♀ (*G. Popov*) ; v.49, 1 ♀ (*K. M. Guichard*) ; 1.ii.47, 2 nymphs (*W. H. Wood*) ; Borama, 1.iii.48, 1 ♀ (*B. P. Uvarov*) ; xii.32–i.33, 1 ♂ ; 42° 50′ E., 10° 36′ N., iii.1933, 1 ♂ (*R. H. Taylor*). Bawn, 2.vii.57, 1 ♂, 3 ♀ ; w. Harirad, 28.vi.57, 2 ♂, 5 ♀, 1 nymph (*M. Hussein*). Laferrug, 3.xi.49, 1 nymph (*K. M. Guichard*). Burao, iv.35, 1 ♂ (Vet. Dept.) ; x.35, 1 ♀ (*E. Peck*) ; 15.i.54, 2 ♂, 4 ♀ (*G. Popov*). Las Dureh, 9.xii.53, 1 ♀ ; Abdulqader, 9.iii.57, 7 ♂, 2 ♀, 2 nymphs (*G. Popov*). Jire, 26.iii.57, 2 ♂, 5 ♀ ; Debo pass, 28.iii.57, 2 ♂, 3 ♀ ; w. Husweina, 27.iii.57, 6 ♂, 6 ♀ (*M. Hussein*). Berbera, 7.iii.48, 1 ♀ (*B. P. Uvarov*). Nr. Bulhar, 4.ii.57, 6 ♂, 8 ♀ ; Berbera-Zeila, 24.i.54, 1 ♀ (*G. Popov*). Gan Libah, 2.vi.49, 2 ♂ ; Sheikh, i.v.49, 2 ♀ ; 28.x.49, 1 ♂ ; Bihendulah, 31.v.49, 1 ♀ (*K. M. Guichard*). Debo pass, 21.ii.58, 1 ♀ ; Gerissa, 22.ii.58, 2 ♂, 1 ♀ (*A. Absiyeh*). "Somali" : 1 ♂, (Lort (*sic*) Philipps). Dankalia (French Somaliland) : Lake Abbe, 28.i.54, 7 ♂, 1 nymph ; Lake Assal, 31.i.54, 4 ♂, 2 ♀, 2 nymphs ; Tadjoura-Obock, 31.i.54, 1 ♂ (*G. Popov*). (Ethiopia) : Sardo, 28.vii.46, 6 ♂, 6 ♀ (*K. M. Guichard*).

Sauracris zinae sp. n. (Fig. 18)

Female (type). Small for the genus, but robust, with distinctly swollen body. Frontal ridge in profile projecting between antennae, abruptly lowered at ocellus ; seen from in front deeply sulcate with margins strongly raised and divergent between the antennae, then lowered and narrowing to half the maximum width at the ocellus and wavy and obsolescent

towards clypeus (fig. 7*h*). Fastigium strongly sloping forward, narrow and sulcate, margins converging but not meeting between the eyes, with interocular space distinctly greater than width of antenna.

Pronotum swollen and distinctly raised above level of the head. Transverse sulci broad and shallow, the anterior one almost obsolescent; hind margin almost straight (fig. 8*h*); lateral lobes broadly rounded, almost as high as long. Elytra reduced to minute scales, less than one-quarter length of metanotum. Tympanum vestigial. Subgenital plate obtusely pointed, with rounded lateral projections (fig. 9*h*); upper valve of ovipositor with a smooth edge. Hind femur broad, upper surface rounded, lower external area not expanded. Arolium half length of a claw.

General coloration buff, with faint dark mottling. Three transverse black stripes present on abdominal tergites behind hind femur, as in *S. parvula*. Basal half of hind tibia ivory-white, apical half bright scarlet, again as in *S. parvula*.

Total length 25·5; pronotum 5·2; elytron 0·4; hind femur 12 mm.

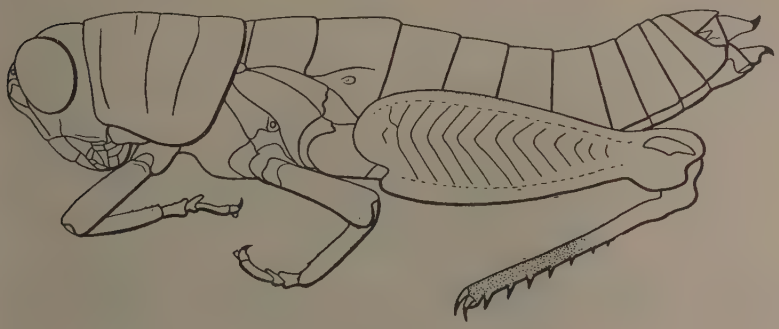

FIG. 18.—*Sauracris zinae* sp. n.

A species of the general size and coloration of *S. parvula*, but quite distinct from it by its convex pronotum with straight hind margin. There are further differences in the structure of the frontal ridge, the fastigium and the hind femur. It has been dedicated to its discoverer, Miss Zina Waloff.

Specimen examined :

SOMALIA : 25 m. north of Galkayu, 22.x.1947, 1 ♀ (*Z. Waloff*).

Sauracris sp. n.

Although the description of this species must await the discovery of adults, it is obviously different from all known species.

Head relatively small, but thorax greatly expanded laterally (fig. 19), giving the body, seen from above, a spindle-shaped appearance.

The insect was found in a small area of *Acacia tortilis* and *Maerua* sp. open woodland, together with *A. p. parvula* and *A. lacerta ;* the last two species,

which were common in this locality, were frequently living side by side on the same tree.

Specimen examined :

Somalia : Nr. El Gal, Mijertein ; 12.i.1957, 1 nymph (*G. Popov*).

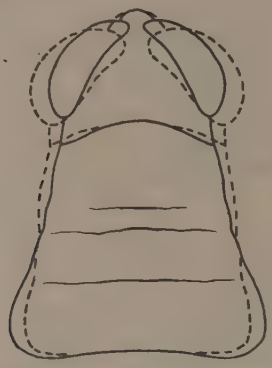

Fig. 19.—*Sauracris* sp. n. (solid line) compared with *S. lacerta* (broken line).

VI. Summary

This revision is based on a study of the types of *Allaga ambigua* Karsch, *Sauracris lacerta* Burr and *Parallaga pigra* Carl as well as considerable material of members of this group from southern Arabia and eastern Africa. *Allaga* is established as a monotypic genus with *A. ambigua* Karsch as its type species. *Sauracris*, with the type species of *S. lacerta* Burr, is reinstated to include the already described species *Parallaga pigra* Carl, *Allaga striolata* Ramme and *A. parvula* Ramme, as well as three new species *S. ornata*, *S. crypta* and *S. zinae* and a new subspecies *S. parvula arabica*, which are described and illustrated.

This group has no near relatives and its possible phylogenetic relationships and origins are discussed. The geographical distribution is described.

The ecology and biology of *Sauracris* based on field observations on some members of this genus are discussed. The most striking aspect of its behaviour is its habit of hiding under the bark of trees by day and emerging to feed and oviposit at night. The egg-pod and the first instar nymphs are described and illustrated.

Keys to genera and species are provided.

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PLATE I

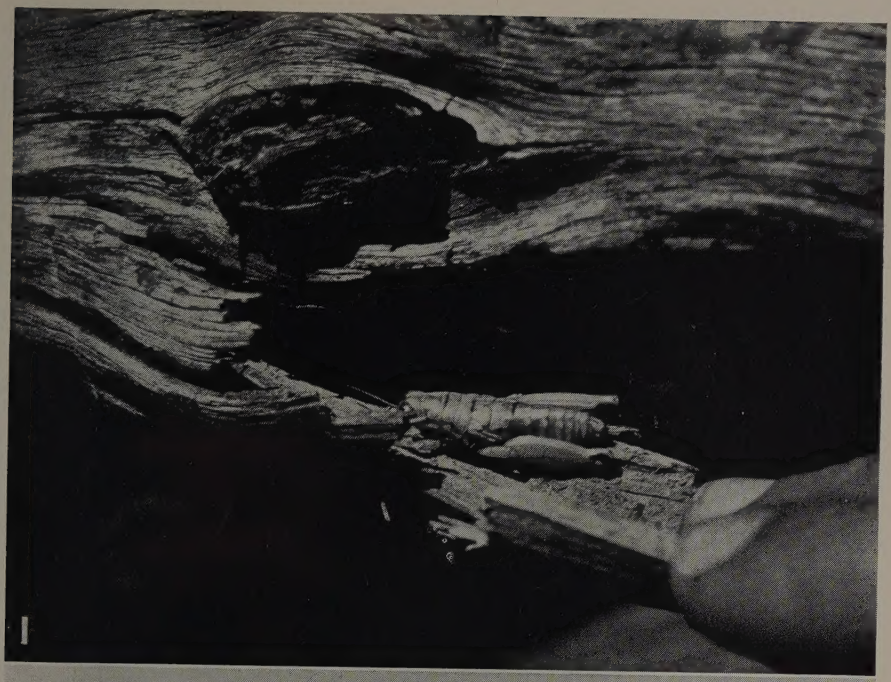
FIG. 1.—Close-up view of *Sauracris crypta* sp. n. near its refuge under the bark of a tree.

FIG. 2.—Arid habitat of *Sauracris parvula parvula* (Ramme) on the Makir coast of Somaliland Protectorate. The sparse vegetation consists of stunted *Acacia tortilis*, *A. horrida* and *A. somalensis*.

PLATE II

FIG. 1.—Xerophilous open woodland in the vicinity of Buran, an example of the habitat of *Sauracris lacerta* Burr. The principal tree is *Acacia bussei*, with the less common *Maerua* sp.

FIG. 2.—*Sauracris ornata* sp. n. has been found only in semi-arid mixed woodland, as shown in this photograph on the slopes of the Erigavo escarpment. The principal vegetation is *Acacia* spp., *Buxus hildebrandtii*, *Euphorbia* sp. and *Dracaena schizantha*.



Typical refuge and habitat of (1) *Sauracris crypta* sp. n. and (2) *S. parvula parvula* (Ramme).

G. B. Popov.

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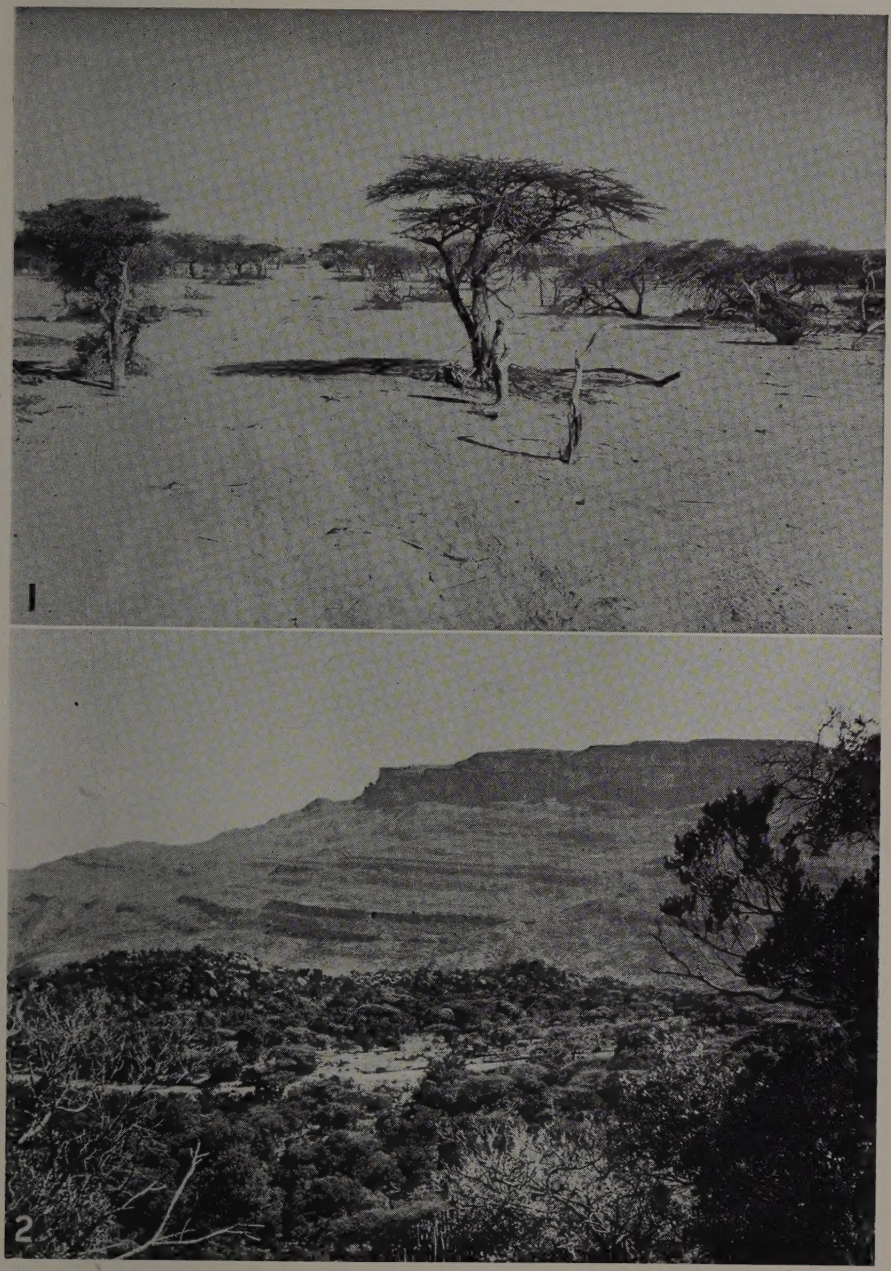

The habitat of (1) *Sauracris lacerta* Burr and (2) *S. ornata* sp. n.

G. B. Popov.

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